CASE HISTORY

Suspension Cable Protection

PROBLEM

The suspension cables on this type of bridge are known to corrode over a long period of time. The 20 inch (508 mm) diameter main cable is constructed from 8322 high tensile galvanized steel wires of 0.196 inches (4.98 mm) in diameter. The total area of the cable is 314 in2 (202,580 mm2) of which approximately 20% is comprised of voids. The cable is wrapped in 0.144 inch (3.66 mm) mild steel galvanized wire. Dehumidification is used to reduce the level of moisture around the cables.

It is known that the dehumidification system does not provide perfect protection. Engineers from Mott MacDonald wanted to find a way to add additional corrosion protection into the system's airflow. Mott MacDonald contacted Lake Chemical to see if Cortec® would have such an inhibitor that could be used this way.

Original thoughts were to fog a VpCI® powder or water based inhibitor into the system but neither of these options was acceptable to the owner. A test rig was built using VpCI® 105 emitters as the source of corrosion inhibitor to see if it would work and to ensure that the inhibitor had no detrimental effect on any of the materials/components of the cable system. The testing proved positive and there were no material incompatibilities noted. The biggest issue was then to find a way to be able to package the inhibitors to ensure that enough of them entered into the airflow and would be distributed around the cables as needed. Cortec's PTC Emitters were developed as a result of this.

APPLICATION

A simple hatch and crate system that is a part of the main dehumidification pipework was developed. This allowed the inhibitor to be put into the airflow without disrupting the system when the product needed to be changed out. Five (5) PTC Emitters per unit are placed into a basket inside the crate with no special separation or spacing of the individual emitters being required. The dosage rate of 5 PTC Emitters per 10 injection sleeve inputs per month was determined by Mott MacDonald/Lake Chemicals.

CONCLUSION

The system has now been running for over 2 years and testing was carried out using a newly developed VpCI® sensor solution to confirm the presence of VpCI® inhibitor in and around the cable. Corrosion rate monitoring and relative humidity testing is carried out and as a supplementary precaution, longer term samples will be held in the VpCI® airstream and tested at pre-determined intervals over the operational life of the system. Control samples are being held in one of the existing plant rooms.

DATE

July 2007

DISTRIBUTOR

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PRODUCTS

PTC Emitters, Patented

4119 White Bear Parkway, St. Paul MN 55110 USA
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